THE DYEING OF LEATHER

WITH THE
DYESTUFFS

OF

CASSELLA COLOR COMPANY

(American Branch of Leopold Casella & Co., A. S. G. M. B.)

182 and 184 Front Street,

NEW YORK.

Boston: 25 Essex Street.

Philadelphia: 108 and 110 South Second Street.

Providence: 24 Exchange Street.

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LEOPOLD CASSELLA & CO., G. m. b. H., FRANKFORT O. M.

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ATLANTA: 47 NORTH PRYOR STREET

MONTREAL, CANADA, 59 WILLIAM STREET.

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Remarks in connection with the Tables of Patterns.

The patterns marked with an asterisk (*) are produced with **Basic Colours**, those marked with a cross (†) with **Acid Colours**, whilst those marked § are dyed according to the method indicated on page 10 for grey and beige shades with the addition of 10 oz soap per 5 doz. skins.

Table

- I and II. **Bark-tanned Cowhides.** Patterns Nos. 1-20 are produced by staining the moist leather and represent shades suitable for **harnesses**, the making of **bags**, and **upholstery**.
- III and IV. **Bark-tanned Goatskins.** Patterns Nos. 21-36 are produced in the tray and represent the favourite mode shades in **boot and shoe manufacture**.
- V. **Bark-tanned Calfskins.** Patterns Nos. 37-46 are dyed in the tray and represent shades for **boot and shoe manufacture**.
- VI-VIII. **Sumac-tanned Calfskins.** Patterns Nos. 47-74 are produced in the tray, Nos. 75 and 76 by staining. These are mode and fancy shades for **fancy goods (pocket-books, purses, etc.)**
- IX-XII. **Sumac-tanned Sheepskins.** Patterns Nos. 77-116 are produced in the tray. The shades are in demand for **leather for book binding, fancy goods and upholstery**.
- XIII and XVII. **Sumac-tanned Skivers.** Patterns Nos. 117-164 are dyed in the tray Nos. 165-167 produced by staining. Some of them are useful for **hat leather** and others for **lining and book binding purposes**.
- XVIII. **Chrome-tanned Calfskins.** | Dyed according to the special instructions given for chrome leather. These kinds of leather are
- XIX. **Chrome-tanned Goatskins.** | used for **boot and shoe manufacture**.

NOTE

NAPHTHYLAMINE BLACK IS THE
SCIENTIFIC NAME OF THE COLOR
KNOWN COMMERCIALY AS ALIZA-
RINE BLACK.

Dissolving the Dyestuffs.

The dyestuffs are best dissolved in tin-plated, enamelled or earthen vessels. Wooden vessels should be avoided, especially if it be of importance to maintain the same concentration of the dyestuff solutions, besides which wooden vessels are rather difficult to clean, so that they should only be employed for dissolving dyestuffs of the same or of similar shades.

a) **Basic Colours** are best dissolved in condensed or very soft water (rain water); if such be not available, ordinary river or well water may of course be used, which must however be corrected first by adding acetic or formic acid. The quantity of the acid to be used may be ascertained from the following tabulation.

100 gallons water of a hardness of 10 English degrees (being equal to 8 German degrees or 14,3 French degrees) require for correction about

9 ¹ / ₄ oz	acetic acid	of 30 0/0,	being equal to	8 deg. Tw., or
5 ¹ / ₂ "	"	"	"	50 0/0, " " " 12 deg. Tw., or
3.4 "	"	"	"	80 0/0, " " " 15 deg. Tw.

or

8 ¹ / ₂ oz	formic acid	of 25 0/0,	being equal to	12 deg. Tw., or
4 ¹ / ₄ "	"	"	"	50 0/0, " " " 24 deg. Tw., or
2 ¹ / ₂ "	"	"	"	80 0/0, " " " 36 deg. Tw.

An exception are the Diamond Phosphines, which otherwise behave like all the other Basic Colours, but which, owing to their indifference towards lime (calcareous water), may be dissolved in all cases without the addition of acetic acid.

The dyestuffs are mixed to an even paste with some cold water and the requisite quantity of acid; if necessary boiling water is then poured over the paste, and after some stirring the dyestuff will be completely dissolved.

b) **Acid Colours** are dissolved in the same manner, but without the addition of acid.

These dyestuffs are generally dyed with the addition of sulphuric or formic acid. It is not, however, advisable to add the acid to the stock solution, such addition being apt to affect the solubility of certain

Acid Colours and to make them partly precipitate. This addition is therefore best made immediately before dyeing.

It is recommended to dissolve just as much dyestuff as may be required for one or two days, because the concentration of the solution is apt to change in summer by evaporation, and in winter by the precipitation of some dyestuff through freezing.

I.

BARK-TANNED AND SUMAC-TANNED
LEATHER.

Preparatory Treatment of the Leather.

This comprises the following manipulations:

1. Careful cleansing of the leather from all unfixed tanning material still adhering by means of thorough drumming or kneading. This includes of course a thorough softening of the leather in case it has been dried previously.

2. Replacing the tannin thus lost by sumac or some other tanning agent favourably affecting the dyeing operation.

3. Mechanical treatment of the leather in order to render the grain smooth and pliant.

4. Sumac-tanned leather, which is not to be dyed immediately, is dried on frames and stored in a dry place, but must before dyeing be soaked well; it is however the general custom to dye the freshly prepared leather straightaway. Bark-tanned leather, after having undergone the above preparatory treatment, is frequently softened slightly with oil. Before dyeing it is then drummed thoroughly.

Application of the Dyestuffs.

a) **Basic Colours** become fixed directly by the tanning material of the leather and therefore call for no additions to the dyebath. The various tanning materials serving for the tanning of the leather are not however all equally well suited for fixing Basic Colours; thus it is necessary to subject bark-tanned leather to a re-tannage with sumac, this tanning material having proved best suited as a bottoming for dyeing. This extra tannage at the same time brings about quite a considerable brightening of the leather which by the tanning with bark has assumed a more or less deep shade. — For sumac-tanned leather, such re-tannage is unnecessary, provided that the dyeing takes place immediately, or at least not long after the tanning process. The longer however the time between the tanning and the dyeing process, the more does the tanning matter fixed on the leather lose the property to uniformly fix the dyestuff; in such a case it is advantageous to resort to a re-tannage with some sumac.

b) **Acid Colours** may be dyed on any kind of leather without previous mordanting, but in order to use them to full advantage, they

should be dyed with an addition of sulphuric or formic acid. As a rule 1 part by weight of concentrated sulphuric acid or 2 parts by weight of formic acid of 50 % are employed for every 4 parts by weight of dyestuff. The acid is added in a highly diluted form, say, in a 1 % solution.

Whether **Basic** or **Acid Colours** are to be used depends on the shades required, as also on the method of dyeing to be followed. Mode shades, such as havana, etc., may be dyed with Basic or with Acid Colours; especially bright and brilliant fancy shades (such as crimson, cochineal, pale blue, pale green, etc.) are as a rule produced to better advantage with Acid Colours, deep shades on the other hand, such as chocolate, are to more advantage produced with Basic Colours. The patterns shown in this book will in this respect offer more details. — Regarding the method of dyeing to be followed, it should be borne in mind that in all instances where the dyeing is done in a bath (in a tray, paddle or drum) and where there are facilities afforded for washing or rinsing the leather after dyeing, the Acid Colours are applicable in the same manner as the Basic Colours, by reason of the fact that any excess of acid can be neutralised, or at least partly so, by the subsequent washing operation. If, however, it is not feasible to wash, as for instance when dyeing by the staining process, Acid Colours should only be recommended if the fixing is to be carried out with formic acid, especially where high demands are made with regard to the durability of the leather. Formic acid evaporates during the drying of the leather, sulphuric acid on the other hand remaining permanently in the leather.

If the goods are required to be **fast to rubbing**, the Acid Colours should in all cases be given the preference, although Basic Colours may also come into consideration for leather which during the dressing is provided with a finish that improves the resistance to rubbing.

In point of **fastness to light** there is little difference between the Basic and Acid Colours enumerated below, this tabulation only containing dyestuffs which are amongst the fastest available for the respective shades.

Fastness to alkalies as a rule comes into consideration only in the case of leather which is to be used for the manufacture of shoes and boots, for which purpose the Diamond Phosphines, which principally serve for producing most mode shades, answer every requirement.

The following products serve principally for dyeing the various kinds of bark-tanned and sumac-tanned leather:

	Basic Colours:	Acid Colours:
Yellow:	Thioflavine TCN Thioflavine T Diamond Phosphine GG	Naphtol Yellow S Milling Yellow O
Orange:	Tannin Orange R Diamond Phosphine R.	Orange II, R, extra, ENZ

Basic Colours:

Acid Colours:

Leather Yellow,	Diamond Phosphine PG	Acid Phosphine JO
Havana,	" " R	Indian Yellow G and R
Beige, etc.:	" " D	Havana Brown S conc.
	Phosphine II.	
Brown:	Bismarck Brown	Havana Brown S conc.
	various brands	Acid Brown
	Nut Brown A	Acid Brown D.
	Tannin Brown B for leather	
	Leather Brown A	
	" " B.	
Brown mode shades are produced with suitable combinations of the above, the following products being used for shading purposes:		
	New Blue D 120	Naphtol Blue Black
	" " FL	Naphtol Black B
	Neutral Blue	Naphtol Blue R
	Leather Brown A	Naphtylamine Blue Black 5B
	Solid Green Cryst. O.	Fast Acid Green BN.
Pink:	Rosazeine 6G.	Brilliant Croceine 5B.
Fast Red,	Safranine,	Brilliant Croceine BOO
Cochineal, etc.:	various brands.	" " MOO
		Croceine AZ
		Scarlet EC
		Milling Red FGG
		Roccelline.
Russian Red,	Russian Red G und B	New Red B for leather
Claret,	Cerise N	Naphtol Red C and EB
Ox-blood, etc.:	Ox-blood A	Amaranth
	Neutral Red extra.	Bordeaux BL.
Heliotrope,	Methyl Violet	Acid Violet 4RS
Violet,	Tannin Heliotrope	Formyl Violet S4B and 6B.
Prune, etc.:	Neutral Violet.	

Blue and red dyestuffs are used for shading, brown dyestuffs for saddening purposes.

Blue:	Methylene Blue DBB	Solid Blue R and 6G
	New Methylene Blue N, GG and other brands	Naphtol Blue R and G
	New Blue D 120 and FL	Pure Soluble Blue
	Neutral Blue.	Water Blue B
		Cyanole, various brands
		Formyl Blue B.

Basic Colours:		Acid Colours:
Green:	Solid Green Crystals O Malachite Green conc. Brilliant Green Cryst. extra.	Acid Green extra conc. and 5G Fast Acid Green BN Cyanole Green B Naphtol Green B.
Olive:	produced with Diamond Phosphine GG, PG or R and New Blue FL, D120 or Methylene Blue DBB.	Indian Yellow G or R and Cyanole extra, Naphtol Blue R or Naphtol Green B.
Grey:		Neutral Black B for leather Nerazine G.
Blue, red, orange and brown dyestuffs are used for shading.		
Black:	Leather Black TBB " " TB " " TG	Nerazine G Naphtylamine Black 4B Naphtylamine Black X2B.

Any of the Basic Colours may be used in combination with one another, likewise the Acid Colours, but Basic and Acid Colours, or their solutions, must not be mixed together. If for a certain shade both Basic and Acid Colours are required, the goods should be dyed with the Acid Colour first and be topped afterwards with the Basic Colour.

Methods of Dyeing.

1. **Staining** is resorted to for large heavy hides (cow hides) which cannot be moved about freely in a dye-vessel, and generally also for all kinds of leather the flesh-side of which is to remain perfectly unstained, and where the flesh can either be only very slightly fluffed or not at all.

In dyeing the leather in the dry state, it is first given a coating of a dilute dyestuff solution, to preclude as far as possible the dyeing turning out uneven; the stronger solution is only applied when the first has been fully absorbed by the leather.

If the leather is to be dyed in a damp state, a strong dyestuff solution may be brushed on straightaway without any risk of unlevel results.

When dyeing the leather damp, the dyestuff solution should not be any stronger than 1 lb dyestuff per 10 gallons water, and in the case of dry leather, the quantity of dyestuff should not exceed 8 oz per

10 gallons. If more concentrated solutions be used, the dyeings of certain dyestuffs cannot be prevented from assuming a bronzy gloss.

If the afore-mentioned concentrations should not prove sufficient for particularly full and deep shades, it is preferable to repeat the staining several times.

Basic Colours, when dissolved as stated on page 1, are applied without any further addition.

Acid Colours are dyed with the addition of 1 part by weight of formic acid of 50 % for every 2 parts by weight of dyestuff. An addition of sulphuric acid is not to be recommended when working according to the staining process (see page 6).

The temperature of the dyestuff solution should be higher than 35° C. (95 deg. F.), but should not exceed 60° C. (140 deg. F.).

2. The **dyeing in the bath** may be carried out:

a) In the **tray**. 1 to 2 dozen skins are dyed in one lot. The skins are folded along the back, the flesh-side inside, and then drawn alternately through the dye-liquor. The quantity of dye-liquor should be sufficient to handle the skins easily. The dyeing lasts 15 to 20 minutes. The temperature of the bath should be 35–45° C. (95–115 deg. F.). For a dozen medium-sized skins, up to 4 oz of Basic Dyestuff or 5 oz of Acid Dyestuff are used.

In some districts the dyeing is carried out in small trays, 2 skins only being dyed at a time which are paired together flesh to flesh. In this case about 1½ gallons of liquor and up to ¾ oz of Basic Dyestuff or 1 oz of Acid Dyestuff are used, the dyeing requiring about ten minutes.

b) In the **paddle** or in the **drum**. The skins are first of all treated with warm water in order to give them the right temperature. The dyestuff solution is then added to the dye-vessel, in which the skins are dyed for about 20 to 30 minutes. It is best to keep the temperature of the liquor between 50 and 55° C. (120 to 130 deg. F.), the volume of liquor being regulated by the size of the vessel and the number of skins to be dyed. Up to 2½ oz of Basic Colour and up to 1½ oz of Acid Colour are the usual quantities allowed for a calf-, goat- or sheep-skin of medium size.

When dyeing in a bath, Basic Colours dissolved in accordance with the indications on page 1 of this volume are applied without any other addition whatever, but for Acid Colours it is necessary to add 1 part by weight of sulphuric acid or 2 parts by weight of formic acid of 50 % for every 4 parts by weight of dyestuff. If sulphuric acid has been used and special requirements are made with regard to durability, it is recommended to wash the leather subsequently to the dyeing, either with plain water or better still with a weak solution of acetate or formate of soda.

Calf-, goat- or sheep-skins are usually dyed in the tray if there is no objection to the border of the flesh-side being stained a hand's breadth, or if the thickness of the skin allows of such stained borders being removed by fluffing. The paddle or drum is applied if the flesh-side is desired to be dyed uniformly, similarly to the grain. Dyeing in the drum, besides being resorted to for the above named different kinds of leather, comes into consideration for the dyeing of neats bellies and necks, and sometimes even for whole cowhides.

Special Dyeing Directions.

Grey and Beige Shades. If the leather prepared in the ordinary way is still in a very acid condition from the tanning, it is first of all milled or kneaded for some time in a borax solution ($\frac{1}{4}\%$). It is then dyed with the Acid Colours indicated below with the addition of a soap solution, either by staining or in the bath, the method of working being the same as usual. No acid should, however, be added, which would in fact have a detrimental effect in this case. For this purpose the following Acid Colours come mainly into consideration:

Grey: Neutral Black B for leather
Nerazine G.

For shading: Orange extra
Orange ENZ, Cyanole FF, Havana
Brown S conc., etc.

Beige, Champagne Colour, Pea
Green, Straw Colour, etc.: Havana Brown S conc.

For shading: Neutral Black B
for leather, Nerazine G, and the
dyestuffs mentioned for Greys.

Leather with a buffed grain is dyed to best advantage with Acid Colours. For fancy shades, only unstuffed leather or leather that has only been stuffed very slightly can be used. First of all the solution of an Acid Colour ($4\frac{1}{2}$ —8 oz per 10 gallons according to requirement) is brushed on **without any acid being added**, or a weaker solution is applied in the bath. After drying the leather, another solution containing not more than $4\frac{1}{2}$ oz dyestuff per 10 gallons water and 3—8 oz formic acid is brushed on, which fixes the dyestuff.

If leather with a buffed grain is to be dyed **black**, it is first given a coating of Nerazine G (1 lb per 10 gallons) with the addition of 8 oz

formic acid of 50 %, and when dry another coating is given with Leather Black TB or TG ($1\frac{1}{2}$ —1 lb per 10 gallons).

Strongly stuffed leather is only suitable for dyeing black; before dyeing, the side to be dyed is rubbed with a lukewarm solution of 1—2 lbs borax per 10 gallons water until the fat attaching thereto is dissolved and the leather allows of being wetted easily. The leather is then blackened in the usual manner, as a rule by staining.

II.

CHROME LEATHER.

Preparation of the Leather.

During its manufacture and dressing, chrome leather is subjected to a good many more treatments of a mechanical character than bark-tanned leather. A sound grain is most essential for ensuring a good colour, and in selecting and treating the raw skins, the following points should therefore in the first place be carefully observed:

1. Only perfectly sound and clean-grained skins should be used for chrome-tannage.

2. The substance of the skin must be left in as good condition as possible, which is best effected

a) by using fresh soaking liquors,

b) by leaving the leather not longer than necessary in the baths of the lime-house,

c) by avoiding too prolonged or intense bating.

3. Skins containing fat must be degreased.

4. The tannage should yield a full leather, free from spots or stains, and leave the grain smooth and soft.

5. After tanning, the leather must be freed from acid as thoroughly as possible (see remarks further on).

6. The flesh-side must be shaved.

7. The fat liquor must penetrate the leather perfectly, without however imparting a fatty or sticky feel either to the grain or the flesh side.

8. The leather must not be dried before it is dyed or blackened, and should be protected as much as possible from light.

When all the afore-mentioned conditions have been fulfilled, the leather is ready for dyeing either

I. with Acid Colours direct, or

II. with Basic Colours, after bottoming with vegetable tannage materials; or again,

III. by a combination of both methods, or is ready

IV. for blackening.

Neutralising Chrome Leather.

All chrome leather, inmaterial whether tanned by the two-bath or one-bath process, contains free acid which cannot be removed by simply washing with water. The following methods may be applied to effect neutralisation:

1. The leather, according to the amount of acid it contains, is treated in the drum for $\frac{1}{2}$ — $\frac{3}{4}$ hour with a solution of at least 2% borax, and then washed thoroughly in water. Or

2. the leather is milled in the drum for $\frac{1}{2}$ hour with a solution of at least 2 lbs phosphate of soda per 100 lbs of leather, and, this liquor having been run off, milled again for $\frac{1}{4}$ hour with a solution of 0,05—0,1% sodium bicarbonate.

The temperature of the bath for neutralising should not exceed about 30° C. (85 deg. F.).

The leather treated as per method 1 is almost completely free from acid; when treated according to method 2 it is neutralised entirely.

Directions for Dyeing and Applying the Dyestuffs.

Chrome leather is as a rule dyed either with Acid or Basic Colours, to best advantage in the drum, because it is essential that the leather be worked very thoroughly.

I. Acid Colours on Chrome Leather.

For dyeing 100 lbs moist leather (weight after shaving) which has been fat-liquored, add the dyestuff solution heated to 50—60° C. (120—140 deg. F.) to the drum, and drum for 15 to 25 minutes. If specially good penetration is desired, $\frac{3}{4}$ —1 $\frac{1}{2}$ oz ammonia is added to the contents of the drum. After the stated time the dyebath is acidulated with sulphuric or formic acid, using 1 part by weight of formic acid of 50%, or half the quantity of sulphuric acid (conc.) for every 2 parts dyestuff in addition to the quantity of acid necessary for neutralising the ammonia which may have been added.

After the addition of the acid the leather is worked for another 10 minutes, at the end of which all the dyestuff must be fixed.

Should the leather require a filling, it may be subjected to re-tannage with vegetable tanning materials (sumac or gambier) in discretionary quantities. The solution of the tanning materials may be added straight to the exhausted dyebath. Such a re-tannage yields a leather allowing of an easier and better dressing.

The following Acid Colours are principally used for the customary shades on chrome leather:

Leather Yellow,	}	Indian Yellow G and R
Light Havana,		Acid Phosphine JO
Dark Havana:		Acid Brown D
		Havana Brown S conc.

For shading purposes:

Naphtol Black B
Naphtol Blue Black.

Tobacco Brown,	}	Havana Brown S conc.
Chocolate and other		shaded with
dark Mode Shades:		Acid Brown D
		Indian Yellow G and R
		Naphtol Black B
		Fast Acid Green BN, etc.

Ox-blood,	}	New Red B for leather
Cherry Red,		Naphtol Red EB
Russian Red, etc.:		Roccelline,
		shaded with the above-named brown dyestuffs.

If the chrome leather, after dyeing with Acid Colours, is to be fatliquored, it is recommended to top such dyeings with Basic Colours. which renders them faster to alkalies.

The topping may be carried out directly after the dyeing and in the exhausted dyebath; for this operation $1\frac{1}{2}$ —8 oz of the following dyestuffs are required per 100 lbs of leather:

Diamond Phosphine	G G
"	" PG
"	" R
"	" D,

either alone or in mixture with

Bismarck Brown EE or
Leather Brown A.

Grey and beige shades are likewise produced with Acid Colours, proceeding however as follows: The neutralised leather is drummed with the fatliquor to which $\frac{1}{2}$ to 4 oz of dyestuff have been added per 100 lbs leather, according to the depth of shade to be dyed. The leather having been drummed for half-an-hour, a decoction of 6–8 lbs sumac, or a solution of 3–4 lbs gambier, is added to the dyebath, and the leather worked for another $\frac{1}{2}$ hour, being then rinsed and set out.

The following dyestuffs are used for

Grey:	Neutral Black B or BN for leather Nerazine G, shaded with any of the above-mentioned Acid Colours.
Beige, Champagne colour, etc.:	Indian Yellow R Acid Phosphine JO shaded with Havana Brown S conc. Acid Brown D Neutral Black B for leather.

II. Basic Colours on Chrome Leather.

The neutralised leather is first treated in the drum with a solution of vegetable tanning materials. Sumac, and frequently also gambier, either alone or in combination with each other or with fustic extract etc., are mostly used for this purpose; for treating 100 lbs leather, the following quantities of a solution of tanning materials of 17° Barkometer are required:

for light shades $1\frac{1}{2}$ gallons,
for dark shades up to $2\frac{1}{2}$ gallons.

Larger quantities of tanning materials alter the character of the chrome leather more or less, without giving better results in the dyeing.

Leather treated in this manner is dyed with Basic Colours exactly in the same way as bark-tanned leather.

The dyeing in the drum or in the paddle is the method mostly used, though in some cases tray-dyeing, and even staining, may be resorted to on occasions.

The duration of the dyeing process is about 10 to 20 minutes at a temperature of 45–50° C. (115–120 deg. F.). During this time, the dyestuff almost completely exhausts. With very deep shades it is an advantage to add the dyestuff in two portions and to dye a few minutes longer if necessary.

The following dyestuffs serve for the production of the most current shades and may be combined in any proportion:

Leather Yellow,	}	Diamond Phosphine D
Havana, etc.:		Diamond Phosphine GG
		Diamond Phosphine PG
		Diamond Phosphine R
		Bismarck Brown EE
		Leather Brown A.
Tobacco Brown,	}	Bismarck Brown EE and PS
Chocolate and other		Leather Brown A
dark Mode Shades:		shaded with
		Diamond Phosphine GG and D
		New Blue D 120
		Solid Green cryst. O.
Ox-blood,	}	Russian Red G and B
Russian Red,		Ox-blood A
Cherry Red, etc.:		Cerise N,
		shaded with the above brown dyestuffs.

III. Dyeing by the Combination Method.

This method is applied always in such cases where the results obtainable by the methods described sub I and II are not satisfactory, i. e. generally for leather the grain of which is not so well suited for the production of coloured leather. This applies chiefly to **chrome-tanned sheep skins**.

The neutralised leather is first fatliquored. For chrome-tanned sheep skins, which contain naturally a considerable amount of fat, a fatliquor is used that contains chiefly soap and egg-yolk and only very little neatsfoot oil.

After the fatliquoring the leather is bottomed in the drum with a suitable combination of wood colours. After $\frac{1}{2}$ hour's drumming slight quantities of sulphate of iron or sulphate of copper are added to fix the wood colours. After further 10 minutes, a solution of Anthracene Colours is added to the same bath, for which purpose

Anthracene Yellow C Powder and
Anthracene Acid Brown B

come chiefly into consideration. After drumming for about 25 minutes with these dyestuffs, the bath is acidulated with $1\frac{1}{2}$ –3 oz of acetic acid (per 100 lbs of leather), the leather being finally topped with Basic Colours, for which purpose

Diamond Phosphine GG and D,
Bismarck Brown EE, FFG and GG, and
Leather Brown A

are principally used.

IV. Black on Chrome Leather.

Chrome leather may be dyed black in a great variety of ways. It is generally dyed in the drum, by which method a full shade of black may be obtained straightaway, or, it is bottomed in the drum, the grain then being blackened with suitable black dyestuffs according to any method desired. When bottoming, blue or violet dyestuffs are often added to obtain a brighter shade on the flesh side.

Two groups of dyestuffs come mainly into consideration for drum dyeing, viz., black Acid Colours and black Substantive Colours, the selection of which is dependent on the condition of the leather, that is to say, whether it still contains a little acid or none at all.

Black Acid Colours:

Neutral Black B for Leather
Neutral Black BN for Leather
Acid Black B for Leather
Acid Black C for Leather
Nerazine G.

These products may be used on any kind of chrome leather in all such cases where direct black shades are to be produced in the drum, even where the chrome leather for some reason or other has been neutralised only in part or not at all.

Black Substantive Colours:

Chrome Leather Black C
Chrome Leather Black 8189J
Chrome Leather Black 8749J conc.
Chrome Leather Black 2061J
Leather Black JE extra conc.

Any of these dyestuffs are suited for dyeing chrome leather which has been fully neutralised or almost entirely so.

The afore-stated dyestuffs may be used in combination with one another or together with Acid Colours, and may also be mixed at will with logwood extract.

All the dyestuffs mentioned are applied alike according to one or other of the following two methods:

A. Direct Black in the Drum.

The leather is drummed for $\frac{1}{2}$ hour with the dyestuff solution; should the bath not be fully exhausted, it is slightly acidulated with acetic acid ($\frac{1}{2}$ - 1 oz per 100 lbs leather) and the drumming continued

for another 10 minutes. Should a treatment with logwood extract prove necessary for filling purposes, a solution of the same may be added straight to the dyebath. The fatliquoring may be done either before or after the dyeing.

About 1—2 lbs of the afore-mentioned dyestuffs are required for every 100 lbs of leather.

B. Bottoming in the Drum and Topping with Basic Colours.

The leather is first dyed for $\frac{1}{2}$ hour in the drum, in order to dye the flesh-side grey, purple or blue. For this purpose, the above-named dyestuffs are used in combination with violet or blue Acid Colours, chiefly the following:

Solid Blue R
Chrome Leather Blue A
Naphtylamine Blue Black B and 5B
Nigrosine soluble in water
Formyl Violet S4B and 8B.

Of the black dyestuffs mentioned, about 3 to 12 oz are sufficient and of the blue and violet dyestuffs $\frac{3}{4}$ to 3 oz, for 100 lbs leather.

Logwood extract may for this method be added to the dyebath in any quantity desired.

The fatliquoring of the leather is best effected by adding the fatliquor to the exhausted dyebath and then drumming for another $\frac{1}{2}$ hour.

The leather bottomed in this fashion is then topped with Basic Colours, which operation may be carried out either in the drum or the tray, or by staining.

The following dyestuffs come into consideration for this purpose:

Leather Black TBB
Leather Black TB
Leather Black TG.

Topping in the drum is done in a fresh bath, 6 oz to 1 lb of dyestuff being sufficient for 100 lbs of leather. A slight addition of acetic acid to the bath is to be recommended. After working for 10 to 15 minutes, the dyestuff becomes fixed.

When the topping is done in the tray, the skins are folded together lengthways, the grain outside, and dipped in the tray in the same way as bark-tanned leather, 1 to 3 oz of Leather Black being sufficient for 1 doz skins.

When the grain is to be blackened by staining, a solution is prepared of 10 to 12 oz Leather Black per 10 gallons water, slightly acidulated with acetic acid (see page 1) and then applied to the leather.

Any dyestuff solution used for the dyeing of blacks on chrome leather should have a temperature of about 45—55° C. (115—130 deg. F.).

III.

CHAMOIS LEATHER.

Preparation of the Leather.

Chamois leather must first of all be freed from any remnant of oil that has remained unfixed, or from any acid or soda that may still be present. In order to ensure the removal of all these substances, the leather is soaked in lukewarm water and then washed well in water containing $\frac{1}{2}$ –1 per cent of borax. If the wash liquor has a milky appearance, the leather is rinsed again in lukewarm water.

Dyestuffs to be employed.

Chamois leather may be dyed with the Acid and Basic Colours mentioned before, according to the respective recipes, provided there are no requirements made with regard to fastness to washing. In view, however, of absolute fastness to washing being essential in by far the majority of cases, the *Immedial Colours* are usually found the most suitable, of which the following come in the first place into consideration:

For yellow:	Immedial Yellow D;
for yellowish brown:	Immedial Yellow Brown EN
	Immedial Cutch G;
for reddish brown:	Immedial Cutch O
	„ „ R;
for claret:	Immedial Bordeaux G conc.
	Immedial Maroon B conc.
for greyish brown:	Immedial Dark Brown A
	„ „ „ D conc.
	Immedial Bronze A;
for olive:	Immedial Olive 3G
	„ „ B;
for green:	Immedial Green GG extra;
for blue:	Immedial Sky Blue Powder conc.
	Immedial New Blue G conc.;
for black:	Immedial Black NN conc.
	„ „ NB.

The dyestuffs are applied as follows:

Dissolve the Immedial Colours in boiling water with the addition of their own weight of sodium sulphide crystals; then allow to cool, and add of formalin one-tenth, and of soap (dissolved in a little water) one-fifth, of the weight of dyestuff.

Dye the leather by kneading or drumming for $1\frac{1}{2}$ hour in the cold solution; then rinse, and wash in a soap solution of about 1%. If the leather be required to be specially smooth, $\frac{1}{3}$ — $\frac{1}{2}$ oz egg-yolk is advantageously added to the soap solution for every skin.

If particularly high demands are made of the dyeings with regard to fastness to rubbing and washing, they should be subjected before soaping to an aftertreatment with a solution of

1 $\frac{1}{2}$ oz sulphate of copper,	} per 10 gallons water.
1 $\frac{1}{2}$ oz bichromate of potash and	
8 oz acetic acid of 50%	

The dyed leather is drummed or kneaded in this solution for $\frac{1}{4}$ hour, and then rinsed thoroughly.

Black on chamois leather has frequently to be produced by staining, which is carried out in the following manner:

Prepare as above stated a solution of

5 lbs Immedial Black NN conc.	} per 10 gallons liquor,
5 lbs sodium sulphide crystals	
1 lb formaldehyde	
1 lb soap	

and apply this solution to the dry leather by means of a brush. After this coating has been absorbed by the leather, another solution is applied in exactly the same manner, consisting of

8 oz sulphate of copper	} per 10 gallons water.
8 oz bichromate of potash	
2 $\frac{1}{2}$ lbs acetic acid of 50%	

The leather is then rinsed several times with water, squeezed, and dried.

For shading black dyeings produced in this manner, Immedial Bordeaux G conc. is used.

Without guarantee.

Bark-tanned Hide.

1*

1 oz Diamond Phosphine PG
 $\frac{1}{32}$ " New Blue D 120.

2*

$1\frac{1}{2}$ oz Diamond Phosphine GG
 $1\frac{2}{3}$ " Diamond Phosphine D.

3*

8 oz Diamond Phosphine D.

4*

1 lb Diamond Phosphine D.

5*

5 oz Diamond Phosphine R
 11 " Diamond Phosphine D.

6*

5 oz Bismarck Brown GG
 11 " Diamond Phosphine D.

7*

13 oz Diamond Phosphine D
 3 " Bismarck Brown GG
 $\frac{1}{3}$ " New Blue D 120.

8*

12 oz Diamond Phosphine D
 4 " Bismarck Brown GG
 $\frac{2}{3}$ " New Blue D 120.

9*

$3\frac{1}{2}$ oz Diamond Phosphine D
 $6\frac{1}{3}$ " Diamond Phosphine GG
 $1\frac{1}{2}$ " Leather Brown A.

10*

8 oz Diamond Phosphine GG
 8 " Bismarck Brown PS
 $\frac{3}{4}$ " Methylene Blue DBB.

Bark-tanned Hide.

11*

1 lb Diamond Phosphine G G.

12*

1 lb Diamond Phosphine P G.

13*

1 lb Diamond Phosphine R.

14†

1 lb Havana Brown S cone.
Formic acid.

15†

1 lb Brilliant Croceine M O O
Formic acid.

16*

12 oz Russian Red G
3 „ Bismarck Brown G G.

17*

8 oz New Blue F L.

18*

3 oz New Blue F L
12 „ Diamond Phosphine G G.

19*

1 lb Leather Black T B pat.

20*

1 lb Leather Black T G pat.

East Indian Goat Skins.

21 †

16 oz Indian Yellow G
5 " Acid Brown D
1 " Naphtol Black B
sulphuric acid.

22 †

16 oz Indian Yellow G
5 " Acid Brown D
2 " Naphtol Black B
sulphuric acid.

23 †

8½ oz Indian Yellow G
12½ " Havana Brown S conc.
1¼ " Naphtol Black B
sulphuric acid.

24 †

16 oz Indian Yellow G
5 " Acid Brown D
½ " Naphtol Black B
sulphuric acid.

25 *

19 oz Diamond Phosphine D
2 " Bismarck Brown GG.

26 *

14¾ oz Bismarck Brown GG
6¼ " Diamond Phosphine GG
1 " Methylene Blue DBB.

27 *

12½ oz Diamond Phosphine D
6¼ " Bismarck Brown GG
2 " New Blue D 120.

28 *

21 oz Diamond Phosphine D
2 " New Blue D 120.

East Indian Goat Skins.

29 §

6 oz Neutral Black B for Leather
1 " Orange ENZ
soap.

30 §

3 oz Neutral Black B for Leather
1 " Orange extra
soap.

31 §

1½ oz Neutral Black B for Leather
1 " Orange extra
soap.

32 *

2 oz Diamond Phosphine PG
1½ dr New Blue D 120.

33 *

21 oz Bismarck Brown PS.

34 *

21 oz Tannin Brown B for Leather.

35 *

16 oz Cerise N.

36 *

21 oz Leather Black TB pat.

Bark-tanned Calf Skins.

37*

2 oz Diamond Phosphine GG
3 " Diamond Phosphine D.

38*

7 $\frac{1}{3}$ oz Diamond Phosphine GG
7 $\frac{1}{3}$ " Diamond Phosphine D.

39*

16 oz Diamond Phosphine PG
5 dr New Blue D 120.

40*

16 oz Diamond Phosphine D.

41*

16 oz Diamond Phosphine D
5 dr New Blue D 120.

42*

2 oz Diamond Phosphine D
1 " Diamond Phosphine PG.

43*

6 $\frac{1}{4}$ oz Diamond Phosphine D
4 " Diamond Phosphine R.

44*

16 oz Diamond Phosphine D
5 " Bismarck Brown GG
5 dr New Blue D 120.

45*

16 oz Russian Red G.

46*

21 oz Leather Black TG pat.

Sumac-tanned Calf Skins.

47 §

2 oz Havana Brown S conc.
soap.

48 §

5 oz Havana Brown S conc.
soap.

49 §

2 oz Havana Brown S conc.
 $\frac{1}{2}$ " Neutral Black B for Leather
soap.

50 §

5 oz Havana Brown S conc.
2 " Neutral Black B for Leather
soap.

51 *

16 oz Diamond Phosphine GG
 $\frac{1}{2}$ " Neutral Violet extra.

52 †

2 oz Havana Brown S conc.
sulphuric acid.

53 †

21 oz Havana Brown S conc.
sulphuric acid.

54 *

$8\frac{1}{2}$ oz Diamond Phosphine GG
 $12\frac{1}{2}$ " Diamond Phosphine D.

55 †

21 oz Havana Brown S conc.
 $\frac{3}{4}$ " Naphthol Black B
sulphuric acid.

56 *

$14\frac{1}{4}$ oz Diamond Phosphine D
 $6\frac{1}{4}$ " Bismarck Brown GG.

Sumac-tanned Calf Skins.

57*

21 oz Diamond Phosphine D.

58†

21 oz Havana Brown S conc.
 $\frac{3}{4}$ " Naphtol Blue R
 sulphuric acid.

59*

$14\frac{3}{4}$ oz Diamond Phosphine D
 4 " Bismarek Brown GG
 2 " Leather Brown A.

60*

$6\frac{1}{4}$ oz Diamond Phosphine GG
 $14\frac{3}{4}$ " Bismarek Brown GG
 $\frac{3}{4}$ " Methylene Blue DBB.

61*

16 oz Diamond Phosphine D
 5 " Bismarek Brown GG
 6 dr New Blue D 120.

62*

$12\frac{1}{2}$ oz Diamond Phosphine D
 $8\frac{1}{2}$ " Bismarek Brown GG
 $\frac{3}{4}$ " New Blue D 120.

63*

$12\frac{1}{2}$ oz Leather Brown A
 4 " Diamond Phosphine GG
 6 dr Methylene Blue DBB.

64†

26 oz Brilliant Croecine MOO
 sulphuric acid.

65*

21 oz Safranine S No 150.

66*

16 oz Cerise N.

Sumac-tanned Calf Skins.

67 §

2 oz Nerazine G
soap.

68 §

10½ oz Nerazine G
soap.

69 §

21 oz Neutral Black B for Leather
soap.

70 §

2 oz Nerazine G
⅓ dr Naphtol Red C
soap.

71 †

21 oz Naphtol Green B
sulphuric acid.

72 *

6¼ oz Methylene Blue DBB
14¼ " Diamond Phosphine G.G.

73 *

16 oz Methylene Blue DBB.

74 *

4 oz Tannin Heliotrope
2½ dr Methylene Blue DBB.

75 *

19 oz Leather Black TB pat.

76 *

19 oz Leather Black TG pat.

The quantities of dyestuff for No 67-74 to be understood for 5 doz. skins,
for No 75-76 (stained) for 10 gallons.

Sumac-tanned Sheep Skins.

77 †

26 oz Brilliant Croceïne BOO
sulphuric acid.

78 †

26 oz Brilliant Croceïne MOO
sulphuric acid.

79 †

26 oz Roccelline
sulphuric acid.

80 *

12 1/2 oz Russian Red A
8 1/2 „ Diamond Phosphine R.

81 *

21 oz Russian Red G.

82 *

21 oz Ox-blood A.

83 *

12 1/2 oz Ox-blood A
8 1/4 „ Diamond Phosphine R.

84 *

10 1/2 oz Bismarek Brown G G.

85 *

4 oz Tannin Heliotrope
3 dr Methylene Blue DBB.

86 *

10 1/2 oz Tannin Heliotrope.

Sumac-tanned Sheep Skins.

87 †

4 oz Havana Brown S conc.

88 *

10 1/2 oz Diamond Phosphine D.

89 *

19 oz Diamond Phosphine D
2 " Bismarek Brown G G.

90 *

21 oz Diamond Phosphine D.

91 *

10 1/2 oz Diamond Phosphine D
3 dr New Blue D 120.

92 †

12 1/2 oz Havana Brown S conc.
8 1/2 " Indian Yellow G
sulphuric acid

93 †

21 oz Havana Brown S conc.
sulphuric acid.

94 *

17 oz Diamond Phosphine D
3 " Bismarek Brown G G
6 dr New Blue D 120.

95 *

17 oz Diamond Phosphine D
3 " Bismarek Brown G G
9 dr New Blue D 120.

96 *

14 3/4 oz Diamond Phosphine D
6 1/4 " Leather Brown A
9 dr New Blue D 120.

Sumac-tanned Sheep Skins.

97 †

8 1/2 oz Acid Green 5 G
1 1/2 " Indian Yellow R
sulphuric acid.

98 †

8 1/2 oz Acid Green 5 G
sulphuric acid.

99 †

6 1/4 oz Acid Green extra conc.
1 " Orange extra
sulphuric acid.

100 *

4 oz Malachite Green conc.
17 " Diamond Phosphine P G.

101 *

1 1/2 oz New Blue D 120
16 " Diamond Phosphine G G.

102 *

2 oz New Blue FL
19 " Diamond Phosphine G G.

103 *

5 oz New Blue FL
16 " Diamond Phosphine G G.

104 †

10 1/2 oz Cyanole Green B
sulphuric acid.

105 †

10 1/2 oz Cyanole Green B
1 1/2 " Orange extra
sulphuric acid.

106 †

21 oz Acid Green extra conc.
5 " Indian Yellow G
sulphuric acid.

Sumac-tanned Sheep Skins.

107 *

8 1/2 oz Neutral Red extra
2 " Diamond Phosphine R
3 dr Methylene Blue DBB.

108 †

2 oz Indian Yellow R
10 1/2 " Naphtol Green B
sulphuric acid.

109 §

21 oz Nerazine G
soap.

110 §

7 1/3 oz Havana Brown S conc.
soap.

111 †

10 1/2 oz Cyanole FF
sulphuric acid.

112 *

16 oz Methylene Blue DBB.

113 †

5 oz Pure Soluble Blue
sulphuric acid.

114 †

21 oz Solid Blue R
sulphuric acid.

115 †

21 oz Naphtol Blue R
sulphuric acid.

116 *

21 oz Leather Black TB pat.

Skivers (Sheep).

117 §

1 oz Havana Brown S conc.
soap.

118 §

2 oz Havana Brown S conc.
 $\frac{1}{2}$ " Neutral Black B for Leather
soap.

119 §

5 oz Havana Brown S conc.
1 " Neutral Black B for Leather
soap.

120 §

5 oz Havana Brown S conc.
soap.

121 †

$12\frac{1}{2}$ oz Indian Yellow R
 $8\frac{1}{2}$ " Havana Brown S conc.
sulphuric acid.

122 †

$12\frac{1}{2}$ oz Havana Brown S conc.
 $8\frac{1}{2}$ " Indian Yellow G
3 dr Naphtol Black B
sulphuric acid.

123 *

$10\frac{1}{2}$ oz Diamond Phosphine G G.

124 *

$6\frac{1}{4}$ oz Diamond Phosphine G G
 $14\frac{1}{4}$ " Diamond Phosphine D.

125 *

4 oz Diamond Phosphine G G
14 " Diamond Phosphine D
3 dr New Blue D 120.

126 *

21 oz Diamond Phosphine D.

Skivers (Sheep).

127 *

8 1/2 oz Bismarck Brown PS
8 1/2 " Diamond Phosphine GG
2 " Leather Brown A.

128 *

12 1/2 oz Nut Brown A
3 " Leather Brown A.

129 *

8 1/2 oz Diamond Phosphine R
3 " Tannin Heliotrope
1 " Methylene Blue DBB.

130 *

21 oz Bismarck Brown GG.

131 *

16 oz Diamond Phosphine R
1 " New Blue FL.

132 *

16 oz Diamond Phosphine R
1 " Bismarck Brown GG
1 " New Blue FL.

133 *

10 1/2 oz Diamond Phosphine R
1 " Methylene Blue DBB.

134 *

8 1/2 oz Diamond Phosphine GG
3 " Tannin Heliotrope
1 " Methylene Blue DBB.

135 *

16 oz Diamond Phosphine R
2 " Bismarck Brown GG
2 " New Blue FL.

136 *

16 oz Diamond Phosphine R
1 " Bismarck Brown GG
2 " New Blue FL.

Skivers (Sheep).

137 *

1 oz Rosazeine 6 G.

138 *

4 oz Tannin Heliotrope.

139 *

1 oz Tannin Heliotrope
1 1/2 dr Methylene DBB.

140 *

4 oz Tannin Heliotrope
2 " Diamond Phosphine R
1 " Methylene Blue DBB.

141 †

26 oz Brilliant Croceine B O O
sulphuric acid.

142 †

26 oz Scarlet EC
sulphuric acid.

143 *

21 oz Safranine G extra No 0.

144 *

16 oz Cerise N.

145 *

16 oz Ox-blood A.

146 *

8 1/2 oz Diamond Phosphine R
3 " Tannin Heliotrope.

Skivers (Sheep).

147 *

10½ oz Diamond Phosphine GG
½ „ Methylene Blue DBB.

148 *

16 oz Diamond Phosphine GG
3 „ Methylene Blue DBB.

149 †

21 oz Naphtol Green B
sulphuric acid.

150 †

10½ oz Acid Green 5 G
1 „ Indian Yellow R
sulphuric acid.

151 †

8½ oz Cyanole FF
2 „ Indian Yellow R
sulphuric acid.

152 †

14¾ oz Cyanole FF
6¼ „ Indian Yellow R
sulphuric acid.

153 *

19 oz Diamond Phosphine GG
2 „ New Blue FL.

154 *

10½ oz Solid Green Crystals O.

155 †

10½ oz Brilliant Naphtol Blue B pat.
1 „ Indian Yellow R
sulphuric acid.

156 *

12½ oz Leather Black TBB pat.
6¼ „ Solid Green Crystals O.

Skivers (Sheep).

157 §

5 oz Neutral Black B for Leather
6 dr Havana Brown S conc.
soap.

158 §

10 1/2 oz Neutral Black B for Leather
soap.

159 §

21 oz Neutral Black B for Leather
1 1/4 „ Havana Brown S conc.
soap.

160 †

10 1/2 oz Cyanole FF
sulphuric acid.

161 †

3 oz Water Blue R
sulphuric acid.

162 *

8 1/2 oz Methylene Blue DBB.

163 †

21 oz Solid Blue 6G
sulphuric acid.

164 †

2 1/2 oz Nerazine G
sulphuric acid.

165 *

19 oz Leather Black TB pat.

166 *

19 oz Leather Black TG pat.

The quantities of dyestuff for No 157 164 to be understood for 5 doz. skins,
for No 165-166 for 10 gallons, to be applied by staining.

Chrome-tanned Calf Skins.

167

0,3 % Neutral Black B for Leather
0,04 % Havana Brown S conc.

Method I, page 17.

168

0,4 % Diamond Phosphine GG
0,6 % Diamond Phosphine D
0,02 % New Blue D 120.

Method II, pages 18 and 19.

169

1 % Diamond Phosphine D
0,04 % Leather Brown A.

Method II, pages 18 and 19.

170

2 % Diamond Phosphine D
0,06 % Leather Brown A
0,05 % New Blue D 120.

Method II, pages 18 and 19.

171

1,5 % Fustic Extract
0,1 % Logwood Extract
0,4 % Anthracene Yellow C Powder
0,1 % Anthracene Acid Brown B pat.
0,05 % Bichromate of Potash
0,2 % Diamond Phosphine D.

Method III, page 19.

172

1,5 % Fustic Extract
0,15 % Logwood Extract
0,4 % Anthracene Yellow C Powder
0,4 % Anthracene Acid Brown B pat.
0,04 % Sulphate of Iron
0,02 % Sulphate of Copper
0,2 % Diamond Phosphine GG.

Method III, page 19.

173

1,2 % Havana Brown S conc.
0,2 % Indian Yellow G
0,1 % Naphthol Black B.

Method I, pages 16 and 17.

174

1,2 % Cerise N
0,3 % Bismarck Brown FFG.

Method II, pages 18 and 19.

175

1,25 % Leather Black J Eextra conc. pat.
0,25 % Naphthylamine Blue Black 5 B
0,5 % Logwood Extract.

Method IVa, page 20.

176

0,5 % Nerazine G
0,1 % Formyl Violet 8 B
0,5 % Logwood Extract
topped with
1 lb Leather Black TB pat.
per 10 gallons liquor.

Method IVb, page 21.

Chrome-tanned Goat Skins.

177

0,4 % Havana Brown S conc.
Method I, page 17.

178

0,3 % Havana Brown S conc.
0,05 % Neutral Black B for Leather
Method I, page 17.

179

0,6 % Nerazine G
Method I, page 17.

180

0,8 % Indian Yellow G
0,2 % Havana Brown S conc.
topped with
0,4 % Diamond Phosphine G.G.
Method I, pages 16 and 17.

181

0,8 % Indian Yellow G
0,4 % Havana Brown S conc.
0,04 % Naphtol Black B
topped with
0,4 % Diamond Phosphine G.G.
Method I, pages 16 and 17.

182

2 % Diamond Phosphine D.
Method II, pages 18 and 19.

183

0,5 % Indian Yellow G
0,5 % Havana Brown S conc.
0,06 % Naphtol Black B
topped with
0,2 % Diamond Phosphine G.G.
Method I, pages 16 and 17.

184

1 % Diamond Phosphine D
0,05 % Bismarck Brown EE
0,04 % New Blue D 120.
Method II, pages 18 and 19.

185

1 % Leather Black JE extra conc. pat.
0,4 % Logwood Extract.
Method IV, page 20.

186

1 % Chrome Leather Black 2061-J pat.
0,4 % Logwood Extract.
Method IV, page 20.

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